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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/540,128      | 03/31/2000  | Robbin Hughes        | 990253              | 3976             |

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Qualcomm Incorporated  
Patents Department  
5775 Morehouse Drive  
San Diego, CA 92121-1714

EXAMINER

TRAN, KHANH C

ART UNIT PAPER NUMBER

2631

DATE MAILED: 06/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/540,128 | <b>Applicant(s)</b><br>HUGHES ET AL. |  |
|                              | <b>Examiner</b><br>Khanh Tran        | <b>Art Unit</b><br>2631              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4,11,12 and 18 is/are allowed.
- 6) ☒ Claim(s) 1-3,5-10,13-17 and 19-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The Amendment filed on 04/07/2005 has been entered. Claims 1-21 are pending in this Office action.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 14-17 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe U.S. Patent 6,044,104 in view of Murai et al. U.S. 6,154,487.

Regarding claims 1 and 15, Watanabe invention is directed to cell search methods and mobile station apparatuses used for cellular systems. In column 3 line 39 through column 4 line 62, Watanabe discloses in figure 1 a mobile station apparatus including a search section, which comprises N search correlators 3, a control section 7, and a search control section 8.

The search control section 8 divides a search window into a number of search widths corresponding to the number of search correlators 3, and makes each of correlators 3 carry out correlative detection about these divided search widths simultaneously in a short integrating time. Since the outputs of these correlators 3 use a short integrating time to shorten a search time, they do not suppress interference or noise sufficiently nor achieve the accuracy to carry out cell judgment. In light of the foregoing disclose, it will be appreciated by one of ordinary skill in the art of wireless communications that the search is equivalent to a coarse search as claimed, using coarse search parameters including dividing the search window into a number of search widths, corresponding to the claimed dividing a PN space into segments, using short integration time, corresponding to the claimed selecting an integration time interval.

Watanabe does not expressly teach the claimed features "selecting an integration interval from a plurality of predetermined intervals".

In US Patent '487', in column 6, lines 40-60, Murai et al. discusses that in order to shorten the acquisition time, by setting the number of integrations for averaging and using a plurality threshold levels, primary evaluation may be accomplished based on a short integration time and a low threshold level, and a secondary evaluation may be executed based on longer integration time in a case where there is a high possibility that the reception timing matches. One of ordinary skill in the art would have recognized that primary evaluation corresponds to the claimed coarse search, a secondary evaluation corresponds

to the claimed fine search, and the number of integrations set for averaging corresponds to the claimed plurality of predetermined integration intervals.

Watanabe and Murai et al. teachings are in the same field of endeavors.

Because Murai et al. discusses primary evaluation may be accomplished based on a short integration time, and a secondary evaluation may be executed based on longer integration time in a case where there is a high possibility that the reception timing matches, it would have been obvious for one of ordinary skill in the art at the time of the invention that Watanabe cell search method can be modified to select the first integrating time from a number of integrations set for averaging as taught in Murai et al. invention. Motivation is shortening the synchronization-acquisition time as discussed in Murai et al. invention.

Watanabe does not teach the claimed limitation "selecting a number of non-coherent passes from a range of non-coherent passes".

In column 6, lines 25-45, Murai et al. further discusses that generally, in order to reduce effect of noise, the correlative powers obtained at the same timings are, in many cases, and the average correlation power is used to determine the completion of synchronization. In figure 21, an averaging unit (non-coherent accumulator) 46 integrates correlation power for a predetermined number of times (e.g. number of non-coherent passes) so as to average the power, and thereby reduce the effect of noise. Referring to figure 2 of Watanabe invention, since the outputs of theses correlators 3 use a short integrating time to shorten a search time, they do not suppress interference or noise sufficiently. In

view of that, one of ordinary skill in the art at the time of the invention would have been motivated to average correlation power, which is obtained at every symbol interval for a predetermined number of times as discussed in Murai et al. invention. Motivation is the average correlation powers obtained at the same timings are used for reducing the effect of noise as discussed in Murai et al. invention.

Return to Watanabe invention, in column 4 lines 15-50, Watanabe further discloses that search control section 8 selects multiple phases in high-low-order of the detected correlation values, makes each correlator carry out correlative detection for these selected phases in an integrating time longer than the first integration time. In light of the foregoing, results from the first search are applied to a second search, which corresponds to the claimed using the results of the coarse search parameters for use in a second search.

Figure 3(a) illustrates the operations of search correlators 3 on a time scale for searching the strength of the pilot signal channels of 5 base station apparatuses A to E. Hence, it will be appreciated that the mobile station apparatus in figure 1 can receive pilot signals from a plurality of base stations, wherein each pilot signal is inherently transmitted at a different time offset than those of other base stations.

Regarding claims 2 and 16, as disclosed in column 4, lines 15-35, Watanabe teaches using a short integrating time to shorten a search time, one of ordinary skill in

the art would have recognized that number of non-coherent passes is reduced since Watanabe teaches no accuracy is needed to carry cell judgment for coarse search.

Regarding claims 3 and 17, as recited in claim 1, a short integrating time is used for a coarse search, and a integrating time long enough is used to obtain the accuracy to carry out cell judgment on the specified phases.

Regarding claim 14, claim 14 is rejected on the same ground as for claim 1 because of similar scope. However, Murai et al. does not teach any specificity on the ranges of noncoherent passes and integration interval. Nevertheless, because Watanabe teaches that the outputs of correlators 3 as shown in figure 2 use a short integrating time to shorten a search time, it would have been obvious for one of ordinary skill in the art at the time of the invention that the claimed ranges of non-coherent passes and integration interval are within Murai et al. disclosure. Motivation is the claimed ranges are short enough (e.g. one coherent pass, 0.06 msec integration time) for shortening the search time.

Regarding claim 15, claim 15 is rejected on the same ground as for claim 1 because of similar scope.

Regarding claim 19, claim 19 is rejected on the same ground as for claim 14 because of similar scope. Furthermore, Watanabe does not disclose dividing the search

window into un-equal segments as claimed in the pending patent application. However, it would have been obvious for one of ordinary skill in the art that Watanabe teachings can be modified to divide the search window into unequal widths. Motivation is to have flexible search width as appreciated by one of ordinary skill in the art.

Regarding claim 20, figure 2 of Watanabe invention shows the search widths are equal.

Regarding claim 21, Watanabe does not disclose dividing the search window into N equal or unequal segments as claimed in the pending patent application. However, it would have been obvious for one of ordinary skill in the art that Watanabe teachings can be modified to divide the search window into unequal widths. Motivation is to have flexible search width as appreciated by one of ordinary skill in the art.

4. Claims 5-10, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe U.S. Patent 6,044,104 and Murai et al. U.S. Patent 6,154,487 as applied to claim 1 above, and further in view of Byun U.S. Patent 6,445,728 B1.

Regarding claim 5, as recited in claim 1, referring to figure 1 in Watanabe invention, the 1<sup>st</sup> to Nth search correlators 3 constitute the claimed search engine, wherein the 1<sup>st</sup> to Nth search correlators 3 are configured to receive search parameters, to conduct a search signals within divided windows, and to



output the correlative values. The search control section 8 constitutes the claimed controller, wherein the search control section 8 is configured to pass search parameters to the 1<sup>st</sup> to N<sup>th</sup> search correlators 3. The claimed set of the coarse search parameters as set forth in the claim is already addressed in claim 1. Watanabe method further discloses that after the first search result, search control section 8 rearranges the correlative values in the order of electric power and selects multiple phases starting with the one with the maximum power and passes the selected phases to the 1<sup>st</sup> to N<sup>th</sup> search correlators 3. According to further teachings, when there is no need to carry out a high-speed cell search, it can stop more than one correlator and insert a time for the correlators to stop during the cell search cycle. The high-speed cell search corresponds to the initial search at a short integration time. In light of the foregoing, it would have been obvious for one of ordinary skill in the art that after the initial search, only correlators, corresponding to certain window widths having most likely to contain a pilot signal, are operated during a search cycle in the second search.

Watanabe does not expressly disclose a memory as set forth in the claim. The mobile station employing a memory as set forth in the claim is cited in another US patent '728'. Byun discloses a method of establishing search window size for a mobile station in a cellular system, the method including performing a coarse search by finding a correlation energy value at each searcher position within a predetermined first search window, and estimating the size of a second search window to be applied to the mobile station based on said search result. In

figure 2, the mobile station includes a memory 190 for receiving and storing the search results. The search results are passed to control logic 146, corresponding to the controller, through a CPU. The mobile station as taught by Byun has similar structures as the mobile station apparatus taught by Watanabe. As well known in the art of wireless communications, memory is implemented for storing and retrieving data in any mobile station apparatus, therefore, it would have been obvious for one of ordinary skill in the art that the mobile station apparatus taught by Watanabe could be modified to include a memory as disclosed in Byun invention.

The search parameters as set forth in the application claim are discussed in claim 1. Therefore, the rejection argument of claim 1 applies here.

Regarding claims 6 and 9, claims 6 and 9 are rejected on the same ground as for claim 2 because of similar scope.

Regarding claims 7 and 10, claims 7 and 10 are rejected on the same ground as for claim 3 because of similar scope.

Regarding claim 8, claim 8 is rejected on the same ground as for claim 5 because of similar scope.

Regarding claim 13, claim 13 is rejected on the same ground as for claim 8 because of similar scope.

***Allowable Subject Matter***

5. Claim 4 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 4, claim 4 is allowable over cited prior art because the cited references, either singularly or in combination, fail to teach or suggest "wherein if, during the coarse search, sufficient energy is detected at a first offset corresponding to a first PN encoded pilot signal of a first base station, a first fine search parameter is selected to specify an expected range of PN offsets over which the first PN encoded pilot signal is likely to be received".

6. Claims 11-12 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 11, claim 11 is allowable over cited prior art because the cited references, either singularly or in combination, fail to teach or suggest "wherein if, during the coarse search, sufficient energy is detected at a first offset corresponding to a first PN encoded pilot signal of a first base station, a first fine search parameter is

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selected to specify an expected range of PN offsets over which the first PN encoded pilot signal is likely to be received".

7. Claim 18 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 18, claim 18 is allowable over cited prior art because the cited references, either singularly or in combination, fail to teach or suggest "wherein if, during the coarse search, sufficient energy is detected at a first offset corresponding to a first PN encoded pilot signal of a first base station, a first fine search parameter is selected to specify an expected range of PN offsets over which the first PN encoded pilot signal is likely to be received".

### **Conclusion**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT

Phancong Tran

06/20/2005

Examiner KHANH TRAN